SAMSUNG

SAMSUNG Hard Disk Drive Product Guide 2009

We provide the most reliable storage solution

Samsung Electronics

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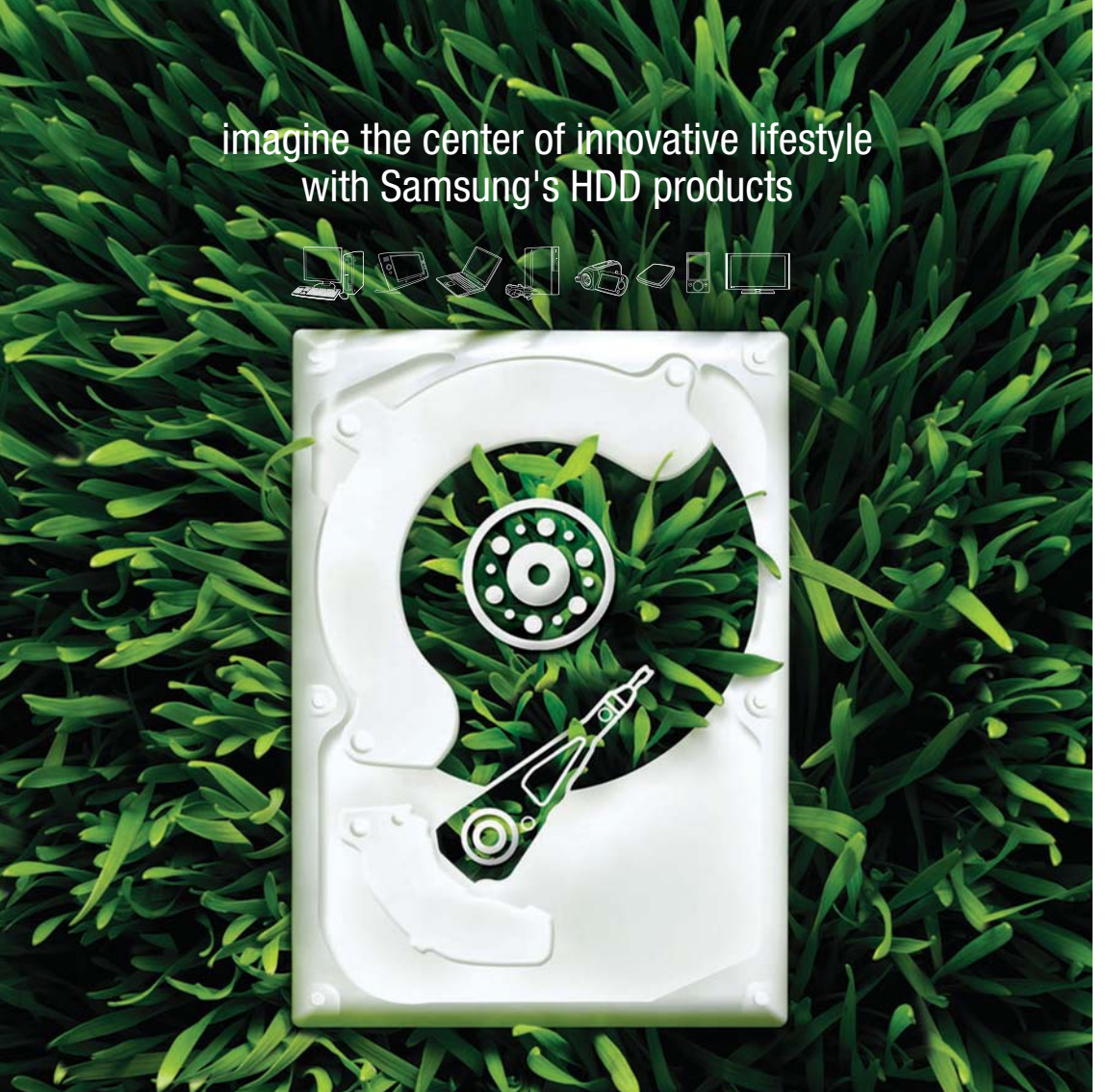
September.2009 (Rev.3.0)



Samsung is committed to pursuing the requirements and satisfaction for our customers. Samsung implements proprietary technology, ideal for today's diverse applications. With Samsung HDD, it's not hard to imagine enjoying new, comfortable lifestyle.

Contents

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Desktop HDD

Spinpoint F3
Spinpoint F1DT
EcoGreen F3 (F3EG)
EcoGreen F2 (F2EG)
EcoGreen F1DT (F1EG)

Best combination of high capacity, data reliability and solid performance meets all your computing needs.

Spinpoint F3

1 TB / 750 GB / 500 GB / 320 GB / 250 GB / 160 GB

Key Features

- Max.500 GB Formatted Capacity Per Disk
- Serial ATA 3.0 Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Rotational vibration sensor(Optional)
- Environment friendly product with RoHS compliance
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Compliant
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

Desktop PC / Digital TV / Home Media Servers

Specifications

Capacity[1]	160 GB	250 GB	320 GB	500 GB	750 GB	1 TB
8 MB	HD164GJ	HD254GJ	HD324HJ			
16 MB	HD163GJ	HD253GJ	HD323HJ	HD502HJ		
32 MB					HD754JJ	HD103SJ

DRIVE CONFIGURATIONS

Interface	Serial ATA 3.0Gbps
Rotational Speed	7,200 RPM
Buffer DRAM Size[2]	8 / 16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek time (typical)		8.9 ms
Average Latency		4.17 ms
Data Transfer Rate		
Media to/from Buffer (Max.)		250 MB/sec
Buffer to/from Host (Max.)		300 MB/sec
Drive Ready Time (typical)	320 / 500 GB	8 sec
	750 GB / 1 TB	11 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles	50,000

ACOUSTICS[2]

Idle	320 / 500 GB	2.5 Bel
	750 GB / 1 TB	2.7 Bel
Performance Seek	320 / 500 GB	2.8 Bel
	750 GB / 1 TB	2.9 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage	+5V±5%,+12V±10%	
Capacity[1]	320/500 GB	750 GB/1 TB
Spin Up Current (12V)	2.0 A	2.2 A
Seek[4]	5.7 W	6.9 W
Read/Write	6.1 W	7.4 W
Idle	5.0 W	6.4 W
Standby(typical)	1 W	1 W
Sleep(typical)	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length		147.0 mm
Weight (Max.)	320 / 500 GB	475 g
	750 GB / 1 TB	625 g

1 GB = 1 billion bytes, 1 TB = 1 trillion bytes.
Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

Spinpoint F1DT

1 TB / 750 GB / 640 GB / 500 GB / 320 GB / 250 GB / 160 GB / 80 GB

Key Features

- Max. 334 GB Formatted Capacity per Disk
- Serial ATA 3.0 Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Environment friendly product with RoHS compliance
- Rotational vibration sensor
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Compliant
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

Desktop PC / Digital TV / Home Media Servers

Specifications

Capacity[1]	80 GB	160 GB	250 GB	320 GB	500 GB	640 GB	750 GB	1 TB
8 MB	HD083GJ	HD161GJ	HD251HJ	HD321HJ	HD501IJ			
16 MB		HD162GJ	HD252HJ	HD322HJ	HD502IJ	HD642JI		
32 MB							HD753LJ	HD103UJ

DRIVE CONFIGURATIONS

Interface	Serial ATA 3.0 Gbps
Rotational Speed	7,200 RPM
Buffer DRAM Size[2]	8 / 16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)		8.9 ms
Average Latency		4.17 ms
Data Transfer Rate		
Media to/from Buffer (max.)		175 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	80~320 GB	8 sec
	500 GB~1 TB	10~12 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles	50,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	80~320 GB	2.5 Bel
	500 GB-1 TB	2.7 Bel
Performance Seek	80~320 GB	2.8 Bel
	500 GB-1 TB	2.9 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage	+5V±5%,+12V±10%		
	80~320 GB	500/640 GB	750 GB/1 TB
Spin Up Current (12V)	2.0 A	2.3 A	2.4 A
Seek[4]	5.7 W	6.9 W	7.6 W
Read/Write	6.1 W	7.4 W	8.4 W
Idle	4.8 W	6.1 W	7.0 W
Standby(typical)	1 W	1 W	1 W
Sleep(typical)	1 W	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length		147.0 mm
Weight (Max.)	80~320 GB	470 g
	500/640 GB	610 g
	750 GB/1 TB	650 g

1. 1 GB = 1 billion bytes, 1 TB = 1 trillion bytes.
Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

EcoGreen F3

1 TB / 750 GB / 500 GB / 320 GB / 250 GB

Key Features

- Max.500 GB Formatted Capacity Per Disk
- Serial ATA 3.0Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Rotational vibration sensor(Optional)
- Environment friendly product with RoHS compliance
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Compliant
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

Desktop PC / Digital TV / Home Media Servers

Specifications

Capacity[1]	250 GB	320 GB	500 GB	750 GB	1 TB
16 MB	HD253GI	HD324HI	HD503HI		
32 MB				HD754JI	HD105SI

DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Buffer DRAM Size[2]	16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)		8.9 ms
Average Latency		5.52 ms
Data Transfer Rate		
Media to/from Buffer (max.)		250 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	250 ~ 500 GB	8 sec
	750 GB / 1 TB	10 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles	50,000

ACOUSTICS [3]

Idle	250 ~ 500 GB	2.2 Bel
	750 GB / 1 TB	2.5 Bel
Performance Seek	250 ~ 500 GB	2.7 Bel
	750 GB / 1 TB	2.8 Bel

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage		+5V±5%,+12V±10%
Capacity[1]	250~500 GB	750 GB / 1 TB
Spin Up Current (12V)	2.0 A	2.2 A
Seek[4]	4.8 W	5.3 W
Read/Write	5.1 W	5.8 W
Idle (typical)	3.9 W	4.6 W
Standby(typical)	1 W	1 W
Sleep(typical)	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length		147.0 mm
Weight (Max.)	250 ~ 500 GB	475 g
	750 GB / 1 TB	625 g

* Notes : Design and specifications are subject to change without prior notice

1.1 GB = 1 billion bytes, 1 TB=1 trillion bytes.
* Accessible capacity may vary as some OS users binary numbering system for reported capacity
2. A small portion of the 16 / 32 MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

EcoGreen F2

1.5 TB / 1 TB / 500 GB

Key Features

- Max.500 GB Formatted Capacity Per Disk
- Environment friendly product with RoHS compliance
- Serial ATA 3.0 Gbps Interface Support
- Improved performance with dual-ARM based firmware
- Improved recording stability over temperature with PMR
- ATA S.M.A.R.T. Compliant
- Advanced dynamic FOD control for best data integrity
- ATA Automatic Acoustic Management Feature
- Intelligent compensation of external disturbance
- ATA 48-bit Address Feature
- SATA Native Command Queuing Feature
- ATA Device Configuration Overlay Feature
- Device Initiated SATA Power Management
- NoiseGuard™
- Rotational vibration sensor
- SilentSeek™

Application

Desktop PC / Digital TV / Home Media Servers

Specifications

Capacity[1]	500 GB	1 TB	1.5 TB
16 MB	HD502HI	HD102SI	HD153UI
32 MB		HD103SI	HD154UI

DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Buffer DRAM Size[2]	16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)		8.9 ms
Average Latency		5.6 ms
Data Transfer Rate		
Media to/from Buffer (max.)		166 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	500 GB	8 sec
	1 TB	11 sec
	1.5 TB	13 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles	50,000

ACOUSTICS [3]

Idle	500 GB	2.2 Bel
	1/1.5 TB	2.5 Bel
Performance Seek	500 GB	2.7 Bel
	1/1.5 TB	2.8 Bel

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage			+5V±5%,+12V±10%
Capacity[1]	500 GB	1 TB	1.5 TB
Spin Up Current (Max)	2.0 A	2.0 A	2.0 A
Seek[4]	4.8 W	5.3 W	5.7 W
Read/Write	5.1 W	5.8 W	6.3 W
Idle (typical)	3.9 W	4.6 W	5.1 W
Standby (typical)	1 W	1 W	1 W
Sleep (typical)	1 W	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length		147.0 mm
Weight (Max.)	500 GB	470 g
	1 TB	610 g
	1.5 TB	650 g

*Notes:Design and specifications are subject to change without prior notice.

1. 1 GB = 1 billion bytes, 1 TB = 1 trillion bytes. Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

EcoGreen F1DT

1 TB / 750 GB / 640 GB / 500 GB / 320 GB / 250 GB

Key Features

- Max. 334 GB Formatted Capacity per Disk
- Serial ATA 3.0 Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Environment friendly product with RoHS compliance
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Compliant
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

Desktop PC / Digital TV / Home Media Servers

Specifications

Capacity[1]	250 GB	320 GB	500 GB	640 GB	750 GB	1 TB
16 MB	HD252HI	HD322HI	HD502JI	HD642JI		
32 MB					HD753LI	HD103UI

DRIVE CONFIGURATIONS

Interface	Serial ATA 3.0 Gbps
Buffer DRAM Size[2]	16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Seek Time (typical)		
Average		8.9 ms
Average Latency		5.56 ms
Data Transfer Rate		
Media to/from Buffer (max.)		140 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	250-320 GB	8 sec
	500 GB~1 TB	12 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles	50,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	250-320 GB	2.2 Bel
	500 GB-1 TB	2.5 Bel
Performance Seek	250-320 GB	2.7 Bel
	500 GB-1 TB	2.8 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage		+5V±5%,+12V±10%	
	250/320 GB	500/640 GB	750 GB/1 TB
Spin Up Current (12V)	2.0 A	2.0 A	2.0 A
Seek[4]	4.8 W	5.2 W	5.7 W
Read/Write	5.1 W	5.6 W	6.3 W
Idle	3.9 W	4.4 W	5.1 W
Standby(typical)	1 W	1 W	1 W
Sleep(typical)	1 W	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length		147.0 mm
Weight (Max.)	250/320 GB	470 g
	500/640 GB	610 g
	750 GB/1 TB	650 g

1. 1 GB = 1 billion bytes, 1 TB = 1 trillion bytes. Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

Samsung Electronics

We provide the most reliable storage solution

RAID Class

Spinpoint F1R

Enterprise drives feature the optimum combination of data reliability, superior performance, and vibration control for high-capacity server and layered storage solution.

Spinpoint F1R racingGreen

1 TB / 750 GB / 640 GB / 500 GB / 320 GB / 250 GB

Key Features

- Max. 334 GB Formatted Capacity per Disk
- Serial ATA 3.0 Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Staggerd Spin-up Support
- Rotational vibration sensor
- Environment friendly product with RoHS compliance
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Compliant
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

SAN-storage Server / NAS-storage Servers

Specifications

Capacity[1]	250 GB	320 GB	500 GB	640 GB	750 GB	1 TB
16 MB	HE252HJ	HE322HJ	HE502IJ	HE642JJ		
32 MB					HE753LJ	HE103UJ

DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Rotational Speed	7,200 RPM
Bufter DRAM Size	8 / 16 / 32 MB
Sector Size[2]	512 bytes

PERFORMANCE SPECIFICATIONS

Seek Time (typical)		
Average		8.9 ms
Average Latency		4.17 ms
Data Transfer Rate		
Media to/from Buffer (max.)		175 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	250/320 GB	8 sec
	500 GB-1 TB	12 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
MTBF	1,200,000 POH
Start/Stop Cycles (Ambient)	50,000

ACOUSTICS

Idle	250/320 GB	2.5 Bel
	500 GB-1 TB	2.7 Bel
Performance seek	250/320 GB	2.8 Bel
	500 GB-1 TB	2.9 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Thermal Gradient (operating)	20°C/hr
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage		+5V±5%,+12V±10%	
	250/320 GB	500/640 GB	750 GB/1 TB
Spin Up Current (12V)	2.0 A	2.3 A	2.4 A
Seek[4]	5.7 W	6.9 W	7.6 W
Read/Write	6.1 W	7.4 W	8.4 W
Idle	4.4 W	6.1 W	7.0 W
Standby	1 W	1 W	1 W
Sleep	1 W	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length		147.0 mm
Weight (Max.)	250/320 GB	470 g
	500/640 GB	610 g
	750 GB/1 TB	650 g

1.1 GB = 1 billion bytes, 1 TB=1 trillion bytes. Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

Samsung Electronics

We provide the most reliable storage solution

Consumer Electronics HDD

Spinpoint F1CE
EcoGreen F1CE

Samsung's hard disks for consumer electronics offer a full range of benefits; quietest operation, playback streaming, and data security.

Spinpoint F1CE

1 TB / 750 GB / 640 GB / 500 GB / 320 GB / 250 GB

Key Features

- Max. 334 GB Formatted Capacity per Disk
- Serial ATA 3.0 Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Environment friendly product with RoHS compliance
- Rotational vibration sensor
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Complian
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

CCTV / DVR / PVR / Digital TV / Home Media Servers / Karaoke system

Specifications

Capacity[1]	250 GB	320 GB	500 GB	640 GB	750 GB	1 TB
8 MB	HA251HJ	HA321HJ				
16 MB			HA501IJ	HA642JJ		
32 MB					HA751LJ	HA101UJ

DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Rotational Speed	7,200 RPM
Buffer DRAM Size[2]	8 / 16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Seek Time (typical)		
Average		8.9 ms
Average Latency		4.17 ms
Data Transfer Rate		
Media to/from Buffer (max.)		175 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	250/320 GB	10 sec
	500 GB -1 TB	14 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles	50,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	250/320 GB	2.5 Bel
	500 GB - 1 TB	2.7 Bel
Performance Seek	250/320 GB	2.8 Bel
	500 GB - 1 TB	2.9 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

POWER REQUIREMENTS

Voltage		+5V±5%,+12V±10%	
	250/320 GB	500/640 GB	750 GB/1 TB
Spin Up Current (12V)	2.0 A	2.0 A	2.0 A
Seek[4]	5.7 W	6.9 W	7.6 W
Read/Write	6.1 W	7.4 W	8.4 W
Idle	4.8 W	6.1 W	7.0 W
Standby	1 W	1 W	1 W
Sleep	1 W	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length (max.)		147.0 mm
Weight (max.)	250/320 GB	470 g
	500/640 GB	610 g
	750 GB/1 TB	650 g

1.1 GB = 1 billion bytes, 1 TB=1 trillion bytes. Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

EcoGreen F1CE

1 TB / 750 GB / 640 GB / 500 GB / 320 GB / 250 GB

Key Features

- Max. 334 GB Formatted Capacity per Disk
- Serial ATA 3.0 Gbps Interface Support
- Improved recording stability over temperature with PMR
- Advanced dynamic FOD control for best data integrity
- Intelligent compensation of external disturbance
- SATA Native Command Queuing Feature
- Device Initiated SATA Power Management
- Environment friendly product with RoHS compliance
- Improved performance with dual-ARM based firmware
- ATA S.M.A.R.T. Compliant
- ATA Automatic Acoustic Management Feature
- ATA 48-bit Address Feature
- ATA Device Configuration Overlay Feature
- NoiseGuard™
- SilentSeek™

Application

CCTV / DVR / PVR / Digital TV / Home Media Servers / Karaoke system

Specifications

Capacity[1]	250 GB	320 GB	500 GB	640 GB	750 GB	1 TB
16 MB	HA252HI	HA322HI	HA502JI	HA642JI		
32 MB					HA753LI	HA103UI

DRIVE CONFIGURATION

Interface	Serial ATA 3.0 Gbps
Buffer DRAM Size[2]	16 / 32 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Seek Time (typical)		
Average		8.9 ms
Average Latency		5.56 ms
Data Transfer Rate		
Media to/from Buffer (max.)		140 MB/sec
Buffer to/from Host (max.)		300 MB/sec
Drive Ready Time (typical)	250 / 320 GB	10 sec
	500 GB - 1 TB	14 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Start/Stop Cycles (Ambient)	50,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	250 / 320 GB	2.2 Bel
	500 GB - 1 TB	2.5 Bel
Performance Seek	250 / 320 GB	2.7 Bel
	500 GB - 1 TB	2.8 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	0~60°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	70 G
Non-operating	300 G
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-300 to 12,000 m

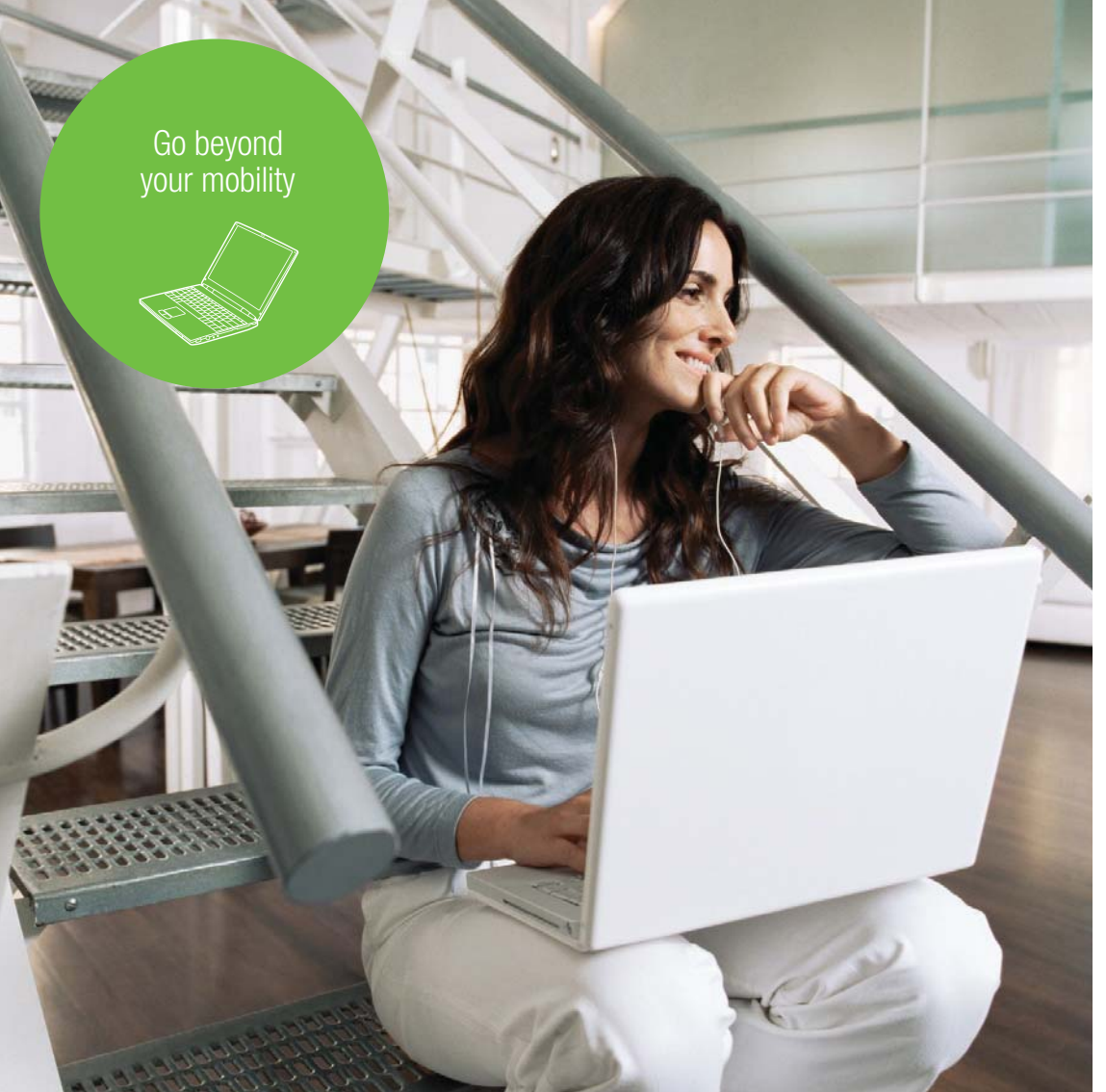
POWER REQUIREMENTS

Voltage		+5V±5%,+12V±10%	
	250/320 GB	500/640 GB	750 GB/1 TB
Spin Up Current (12V)	2.0 A	2.0 A	2.0 A
Seek[4]	4.8 W	5.2 W	5.7 W
Read/Write	5.1 W	5.6 W	6.3 W
Idle(typical)	3.9W	4.4 W	5.1 W
Standby	1 W	1 W	1 W
Sleep	1 W	1 W	1 W

PHYSICAL DIMENSION

Height		26.1 mm
Width		101.5 mm
Length (max.)		147.0 mm
Weight (max.)	250 / 320 GB	470 g
	500 / 640 GB	610 g
	750 GB / 1 TB	640 g

1.1 GB = 1 billion bytes, 1 TB=1 trillion bytes. Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)



Mobile HDD

Spinpoint M7 (Enhanced)
Spinpoint M7U / Spinpoint M7
Spinpoint M5P / Spinpoint M5S
Spinpoint MC30

True mobility in your imagination can be realized with desktop-compatible capacity, quietest operation, and longer battery life.

Spinpoint M7 (Enhanced)

640GB / 500GB / 320GB / 250GB / 160GB

Key Features

- Max. 320 GB formatted capacity per disk
- Serial ATA 3.0Gbps Interface Support
- SATA Native Command Queuing Feature
- TuMR/PMR head with FOD technology
- Load/Unload Head Technology
- ATA Security Mode Feature Set
- ATA S.M.A.R.T. Feature Set
- SilentSeek™
- NoiseGuard™

Application

Slim PC / Note PC / Car Entertainment System / blade Server

Specifications

Capacity[1]	160 GB	250 GB	320 GB	500 GB	640 GB
8 MB	HM161GI	HM251HI	HM321HI	HM501II	HM641JI

DRIVE CONFIGURATION

Interface	SATA 3.0 Gbps
Rotational Speed	5,400 RPM
Buffer DRAM Size[2]	8 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	12 ms
Data Transfer Rate	
Media to/from Buffer (max.)	138 MB/sec
Buffer to/from Host (max.)	300 MB/sec
Drive Ready Time (typical)[3]	4 sec

RELIABILITY SPECIFICATIONS[3]

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)

Idle(typical)	2.4 Bel
Performance Seek[4]	2.6 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~55°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	400 G
Non-operating	900 G
Vibration	
Operating (Random, 10~500Hz)	1.5 Grms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+5V±5%
Spin Up Current (Max.)	1000 mA
Seek (avg)[3]	2.5 W
Read/Write (avg)	2.5 W
Low Power Idle (avg)	0.85 W
Standby (avg)	0.25 W
Sleep (avg)	0.2 W

PHYSICAL DIMENSION

Height (max.)	9.5 mm
Width	69.85 mm
Length (max.)	100 mm
Weight (max.)	105 g

1.1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes
Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8MB buffer memory is reserved for firmware use
3. Power-On to Drive Ready
4. 30% duty cycle, random seek

Spinpoint M7U

500 GB / 320 GB / 250 GB / 160 GB

Key Features

- Max. 250 GB formatted capacity per disk
- TuMR/PMR head with FOD technology
- USB 2.0 Interface Support
- Load/Unload Head Technology
- SilentSeek™
- NoiseGuard™

Application

External Storage

Specifications

Capacity[1]	160 GB	250 GB	320 GB	500 GB
8 MB	HM162HX	HM252HX	HM322IX	HM502JX

DRIVE CONFIGURATION

Interface	USB 2.0
Rotational Speed	5,400 RPM
Buffer DRAM Size[2]	8 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	12 ms
Data Transfer Rate	
Media to/from Buffer (max.)	138 MB/sec
Buffer to/from Host (max.)	60 MB/sec
Drive Ready Time (typical)[3]	4sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle (typical)	2.4 Bel
Performance Seek (typical)	2.6 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~55°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	300 G
Non-operating	900 G
Vibration	
Operating (Random, 10~500Hz)	0.9 Grms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+5V±5%
Spin Up Current (Max.)	750 mA
Seek (typical)	2.8 W
Read/Write (typical)	3.2 W
Idle (typical)	1.6 W
Standby (typical)	1.2 W
Sleep (typical)	1.2 W

PHYSICAL DIMENSION

Height	9.5 mm
Width	69.85 mm
Length	104 mm
Weight (max.)	105 g

1.1MB = 1,000,000 Bytes, 1GB = 1,000,000,000 Bytes
Accessible capacity may vary as some OS uses binary numbering system Read/Write (avg.) 3.2 W for reported capacity
2. A small portion of the 8MB buffer memory is reserved for firmware use Standby (avg.) 1.2 W
3. Power-On to Drive Ready Sleep (avg.l) 1.2 W
4. 30% duty cycle, random seek
5. On Track Read Operation

Spinpoint M7

500 GB / 400 GB / 320 GB / 250 GB

Key Features

- Max. 250 GB formatted capacity per disk
- SATA Native Command Queuing Feature
- TuMR/PMR head with FOD technology
- Serial ATA 3.0 Gbps Interface Support
- Load/Unload Head Technology
- ATA Security Mode Feature Set
- ATA S.M.A.R.T. Feature Set
- SilentSeek™
- NoiseGuard™

Application

Slim PC / Note PC / Car Entertainment System / blade Server

Specifications

Capacity[1]	250 GB	320 GB	400 GB	500 GB
8 MB	HM250HI	HM320II	HM400JI	HM500JI

DRIVE CONFIGURATION

Interface	SATA 3.0 Gbps
Rotational Speed	5,400 RPM
Buffer DRAM Size[2]	8 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	12 ms
Data Transfer Rate	
Media to/from Buffer (max.)	138 MB/sec
Buffer to/from Host (max.)	300 MB/sec
Drive Ready Time (typical)[3]	4 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle (typical)	2.4 Bel
Performance Seek (typical)	2.6 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~55°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	8~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	400 G
Non-operating	900 G
Vibration	
Operating (Random, 10~500Hz)	1.5 Grms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+5V±5%
Spin Up Current (Max.)	1000 mA
Seek (avg)[4]	2.5 W
Read/Write (avg)	2.5 W
Low Power Idle (avg)	0.85 W
Standby (avg)	0.25 W
Sleep (avg.l)	0.2 W

PHYSICAL DIMENSION

Height	9.5 mm
Width	69.85 mm
Length	100.0 mm
Weight (max.)	105 g

* Note : Design and specifications are subject to change without prior notice.
1. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes, Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8MB buffer memory is reserved for firmware use
3. Power-On to Drive Ready
4. 30% duty cycle, random seek
5. On Track Read Operation

Spinpoint M5P

160 GB / 120 GB

Key Features

- Max. 160 GB formatted capacity per disk
- ATA Security Mode Feature Set
- Ultra DMA Mode 5(UDMA100) Compatible
- ATA S.M.A.R.T. Feature Set
- TuMR/PMR head with FOD technology
- Load/Unload Head Technology
- Support Automatic Acoustic Management(AAM)
- NoiseGuard™
- SilentSeek™

Application

Slim PC / Note PC / Game Console

Specifications

Capacity[1]	120 GB	160 GB
8 MB	HM121HC	HM160HC

DRIVE CONFIGURATION

Interface	PATA
Rotational Speed	5,400 RPM
Buffer DRAM Size[2]	8 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	12 ms
Average Latency	5.6 ms
Media to/from Buffer (max.)	103 MB/sec
Buffer to/from Host (max.)	100 MB/sec
Drive Ready Time (typical)[5]	4 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle (typical)	2.2 Bel
Performance Seek (typical)	2.4 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~55°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	325 G
Non-operating	1,000 G
Vibration	
Operating (Random,10~500Hz)	0.73 Grms
Altitute (relative to sea level)	
operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+5V±5%
Spin Up Current (Max.)	900 mA
Seek (typical)[4]	2.1 W
Read/Write (typical)	2.0 W
Low Power Idle (typical)	0.6 W
Standby (typical)	0.25 W
Sleep (typical)	0.1 W

PHYSICAL DIMENSION

Height (max.)	9.5 mm
Width	69.85 mm
Length (max.)	100 mm
Weight (max.)	96 g

1. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes, Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8/16/32MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)
5. Power- On to Drive Ready

Spinpoint M5S

250 GB / 160 GB / 120 GB

Key Features

- Max. 160 GB formatted capacity per disk
- ATA Security Mode Feature Set
- SATA Native Command Queuing Feature
- ATA S.M.A.R.T. Feature Set
- TuMR/PMR head with FOD technology
- Load/Unload Head Technology
- Serial ATA 1.5 Gbps Interface Support
- NoiseGuard™
- SilentSeek™

Application

Slim PC / Note PC / Game Console

Specifications

Capacity[1]	120 GB	160GB	250 GB
8 MB	HM121HI	HM160HI	HM250JI

DRIVE CONFIGURATION

Interface	SATA 1.5 Gbps
Rotational Speed	5,400 RPM
Buffer DRAM Size	8 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	12 ms
Average Latency	5.6 ms
Data Transfer Rate	
Media to/from Buffer (max.)	103 MB/sec
Buffer to/from Host (max.)	150 MB/sec
Drive Ready Time (typical)[3]	4 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)

Idle (Typical)	120/160 GB	2.2 Bel
	250 GB	2.4 Bel
Performance Seek (typical)	120/160 GB	2.4 Bel
	250 GB	2.6 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~55°C
Non-operating	- 40~70°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	325 G
Non-operating	1000 G
Vibration	
Operating (Random, 10~500Hz)	0.73 Grms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+5V±5%
Spin Up Current (Max.)	900 mA
Seek (typical)[4]	2.2 W
Read/Write (typical)	2.0 W
Low Power Idle (typical)	0.6 W
Standby (typical)	0.25 W
Sleep (typical)	0.2 W

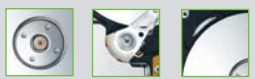
PHYSICAL DIMENSION

Height (max.)		9.5 mm
Width		69.85 mm
Length		100 mm
Weight (max.)	120/160 GB	98 g
	250 GB	102 g

* Note : Design and specifications are subject to change without prior notice.
1. 1MB = 1,000,000 Bytes, 1GB = 1,000,000,000 Bytes Accessible capacity may vary as some OS uses binary numbering system for reported capacity.
2. A small portion of the 8MB buffer memory is reserved for firmware use
3. Power-On to Drive Ready
4. 30% duty cycle, random seek
5. Power requirements based on enabled DIPM & 1.5Gbps speed
6. Unless otherwise specified, specifications are for 250GB configuration

Spinpoint MC30

Automotive 2.5" HDD 30 GB



Key Features

- Max. 30 GB formatted capacity per disk
- ATA Security Mode Feature Set
- GMR head technology with wireless suspension design
- ATA S.M.A.R.T. Feature Set
- ATA 6 (UDMA133) compatible
- Load/Unload Head Technology
- Fluid Dynamic Bearing Spindle Motor Technology
- ALF for Automotive optimization
- NoiseGuard™
- SilentSeek™
- ISO/TS16949 Certified

Application

Car Entertainment System

Specifications

Capacity[1]	30 GB
8 MB	HM031HC

DRIVE CONFIGURATION

Interface	PATA
Rotational Speed	5,400 RPM
Buffer DRAM Size[2]	8 MB
Sector Size	512 bytes

PERFORMANCE SPECIFICATIONS

Read Seek Time (typical)	13 ms
Average Latency	5.6 ms
Data Transfer Rate	
Media to/from Buffer (max.)	51 MB/sec
Buffer to/from Host (max.)	100 MB/sec
Drive Ready Time (typical) [3]	4 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[5]

Idle (Typical)	2.2 Bel
Performance Seek (Typical)	2.4 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	-10~70°C
Non-operating	- 40~85°C
Humidity (non-condensing)	
Operating	5~90 %
Non-operating	5~95 %
Linear Shock (1/2 sine pulse)	
Operating	250 G
Non-operating	850 G
Altitude (relative to sea level)	
Operating (Random,5~500Hz)	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS [5]

Voltage	+5V±5%
Spin Up Current (Max.)	900 mA
Seek (typical)[4]	2.4 W
Read/Write (typical)	2.4 W
Loe Power Idle (typical)	0.85 W
Standby (typical)	0.25 W
Sleep (typical)	0.1 W

PHYSICAL DIMENSION

Height (max.)	9.5 mm
Width	69.85 mm
Length (max.)	100.0 mm
Weight (max.)	96 g

1. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes, Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8 MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.
5. Power-On to Drive Ready

Ultra Mobile HDD

Spinpoint N3U-3
Spinpoint N3C
Spinpoint N3A

Industry-leading ultra mobile hard drives are optimized
to meet all demands for high-capacity storage
in portable devices.

Spinpoint N3U-3

250 GB / 200 GB / 120 GB

Key Features

- Max. 125 GB Formatted Capacity Per Disk
- Bus Power Usage
- Support Plug and Play
- Host Swappable
- High Speed Digital Signal Processor Based Architecture
- ATA S.M.A.R.T Compliant
- ATA 48-bit Address Feature Set
- Multi-Burst On-The-Fly Error Correction
- SilentSeek™

Application

Ultra small external storage

Specifications

Capacity[1]	120 GB	200 GB	250 GB
8 MB	HS122HZ	HS20YJZ	HS25YJZ

DRIVE CONFIGURATION

Interface	USB 2.0
Rotational Speed[2]	3,600 RPM
Buffer DRAM Size	8 MB
Sector Size	4K

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	15.0 ms
Average Latency	8.3 ms
Media to/from Buffer (max.)	68 MB/sec
Interface Transfer Rate (max.)	66 MB/sec
Drive Ready Time (typical)	3.5 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	2.0 Bel
Performance Seek	2.2 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~50°C
Non-operating	- 40~85°C
Humidity (non-condensing)	
Operating	8~90 %
Non-operating	8~90 %
Linear Shock (1/2 sine pulse)	
Operating	450 G
Non-operating	1,500 G
Vibration	
Operating	0.9 Gms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+5V±5%
Spin Up Current (Max.)	550 mA
Seek (typical)	1.3 W
Read/Write (typical)	1.6 W
Idle (typical)	0.8 W
Standby (typical)	0.5 W
Sleep (typical)	0.5 W

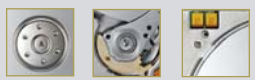
PHYSICAL DIMENSION

Height	120 GB	5.0 mm
	200 / 250 GB	8.0 mm
Width		80.25 mm
Length		54.0 mm
Weight (Max)	120 GB	51 g
	200 / 250 GB	62 g

1. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes
* Accessible capacity may vary as some OS uses binary numbering system for reported capacity.
* A small portion of the (8 MB) buffer memory is reserved for firmware use.

Spinpoint N3C

160 GB / 120 GB / 80 GB / 60 GB



Key Features

- Max.80 GB Formatted Capacity Per Disk
- High Speed Digital Signal Processor Based Architecture
- Low Power HDC
- Fluid Dynamic Bearing Spindle Motor Technology
- SATA S.M.A.R.T Compliant
- SATA 48-bit Address Feature Set
- Multi-Burst On-The-Fly Error Correction
- SilentSeek™
- Free Fall Sensor (optional)

Application

Ultra small external storage / PMP / MP3 Player / HDD Camcorder / Ultra mobile PC

Specifications

Capacity[1]	60 GB	80 GB	120 GB	160 GB
No FFS	HS06VHF	HS08VHF	HS12VJF	HS16VJF
FFS	HS06RHF	HS08RHF	HS12RJF	HS16RJF

DRIVE CONFIGURATION

Interface	SATA 1.5/3.0 Gbps
Rotational Speed	5400 RPM
Buffer DRAM Size[2]	16 MB
Sector Size	512 byte

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	15.0 ms
Average Latency	8.3 ms
Media to/from Buffer (max.)	81 MB/sec
Buffer to/from Host (max.)	150/300 MB/sec
Drive Ready Time (typical)	4.0 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{15} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	2.2 Bel
Performance Seek	2.4 Bel

*Notes:Design and specifications are subject to change without prior notice.

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~60°C
Non-operating	- 40~85°C
Humidity (non-condensing)	
Operating	8~90 %
Non-operating	8~90 %
Linear Shock (1/2 sine pulse)	
Operating	600 G
Non-operating	1500 G
Vibration	
Operating	0.67 Gms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+3.3V±5%
Spin Up Current (Max.)	550 mA
Seek (typical)	1.30 W
Read/Write (typical)	1.50 W
Idle (typical)	0.45 W
Standby (typical)	0.2 W
Sleep (typical)	0.2 W

PHYSICAL DIMENSION

Height	60/80 GB	5.0 mm
	120/160 GB	8.0 mm
Width		78.5 mm
Length		54.0 mm
Weight (Max)	60/80 GB	51 g
	120/160 GB	62 g

1. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes, Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 16 MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.(Average value)

Spinpoint N3A

120 GB / 80 GB / 60 GB

Key Features

- Max.120 GB Formatted Capacity Per Disk
- High Speed Digital Signal Processor Based Architecture
- Low Power HDC
- Advanced Power Management Control
- Fluid Dynamic Bearing Spindle Motor Technology
- ATA S.M.A.R.T Compliant
- ATA 48-bit Address Feature Set
- Multi-Burst On-The-Fly Error Correction
- SilentSeek™
- Free Fall Sensor (optional)

Application

Ultra small external / PMP / MP3 Player / HDD Camcorder / Ultra mobile PC storage

Specifications

Capacity[1]	60 GB	80 GB	120GB
8 MB	HS06YHA	HS08YHA	HS12YHA

DRIVE CONFIGURATION

Interface	PATA
Rotational Speed	3600 RPM
Buffer DRAM Size[2]	8 MB
Sector Size	4 K

PERFORMANCE SPECIFICATIONS

Average Seek Time (typical)	15.0 ms
Average Latency	8.3 ms
Media to/from Buffer (max.)	68 MB/sec
Buffer to/from Host (max.)	66 MB/sec
Drive Ready Time (typical)	3.0 sec

RELIABILITY SPECIFICATIONS

Non-recoverable Read Error	1 sector in 10^{14} bits
Controlled Ramp Load/Unload	600,000

ACOUSTICS (AVERAGE SOUND POWER)[3]

Idle	1.6 Bel
Performance Seek	2.2 Bel

*Notes:Design and specifications are subject to change without prior notice.

S.M.A.R.T COMPLIANT SilentSeek™

ENVIRONMENTAL SPECIFICATIONS

Temperature	
Operating	5~60°C
Non-operating	- 40~85°C
Humidity (non-condensing)	
Operating	8~90 %
Non-operating	8~90 %
Linear Shock (1/2 sine pulse)	
Operating	600 G
Non-operating	1,500 G
Vibration	
Operating (Random, 10~500Hz)	0.67 Grms
Altitude (relative to sea level)	
Operating	-300 to 3,000 m
Non-operating	-400 to 15,000 m

POWER REQUIREMENTS

Voltage	+3.3V ±5%
Spin Up Current (Max.)	400 mA
Seek (typical)[4]	0.6 W
Read/Write (typical)	0.7 W
Idle (typical)	0.30 W
Standby (typical)	0.07 W
Sleep (typical)	0.07 W

PHYSICAL DIMENSION

Height	5.0 mm
Width	71.0 mm
Length	54.0 mm
Weight (max.)	48 g

1. 1 MB = 1,000,000 Bytes, 1 GB = 1,000,000,000 Bytes, Accessible capacity may vary as some OS uses binary numbering system for reported capacity
2. A small portion of the 8 MB buffer memory is reserved for firmware use
3. Average value with a high performance cover.
4. Random seek with 30% duty cycle.

Samsung Electronics

We provide the most reliable storage solution

Line-up

SAMSUNG HARD DISK DRIVE 2009 PRODUCT LIST

F/Factor	Family	Model	Capacity(GB)	RPM	Interface	Buffer	Sector size
Desktop HDD	F3	HD164GJ	160	7200	SATA 3.0 Gbps	8	512
		HD254GJ	250	7200	SATA 3.0 Gbps	8	512
		HD324HJ	320	7200	SATA 3.0 Gbps	8	512
		HD163GJ	160	7200	SATA 3.0 Gbps	16	512
		HD253GJ	250	7200	SATA 3.0 Gbps	16	512
		HD323HJ	320	7200	SATA 3.0 Gbps	16	512
		HD502HJ	500	7200	SATA 3.0 Gbps	16	512
		HD754JJ	750	7200	SATA 3.0 Gbps	32	512
		HD103SJ	1TB	7200	SATA 3.0 Gbps	32	512
	F1DT	HD083GJ	80	7200	SATA 3.0 Gbps	8	512
		HD161GJ	160	7200	SATA 3.0 Gbps	8	512
		HD251HJ	250	7200	SATA 3.0 Gbps	8	512
		HD321HJ	320	7200	SATA 3.0 Gbps	8	512
		HD501IJ	500	7200	SATA 3.0 Gbps	8	512
		HD162GJ	160	7200	SATA 3.0 Gbps	16	512
		HD252HJ	250	7200	SATA 3.0 Gbps	16	512
		HD322HJ	320	7200	SATA 3.0 Gbps	16	512
		HD502IJ	500	7200	SATA 3.0 Gbps	16	512
		HD642JJ	640	7200	SATA 3.0 Gbps	16	512
		HD753LJ	750	7200	SATA 3.0 Gbps	32	512
		HD103UJ	1 TB	7200	SATA 3.0 Gbps	32	512
	F3EG	HD253GI	250		SATA 3.0 Gbps	16	512
		HD324HI	320		SATA 3.0 Gbps	16	512
		HD503HI	500		SATA 3.0 Gbps	16	512
		HD754JI	750		SATA 3.0 Gbps	32	512
		HD105SI	1TB		SATA 3.0 Gbps	32	512
	F2EG	HD502HI	500		SATA 3.0 Gbps	16/32	512
		HD102SI	1 TB		SATA 3.0 Gbps	16/32	512

F/Factor	Family	Model	Capacity(GB)	RPM	Interface	Buffer	Sector size
Desktop HDD	F2EG	HD103SI	1 TB		SATA 3.0 Gbps	16/32	512
		HD153UI	1.5 TB		SATA 3.0 Gbps	16/32	512
		HD154UI	1.5 TB		SATA 3.0 Gbps	16/32	512
	F1EG	HD252HI	250		SATA 3.0 Gbps	16	512
		HD322HI	320		SATA 3.0 Gbps	16	512
		HD502JI	500		SATA 3.0 Gbps	16	512
		HD642JI	640		SATA 3.0 Gbps	16	512
		HD753LI	750		SATA 3.0 Gbps	32	512
		HD103UI	1 TB		SATA 3.0 Gbps	32	512
RAID CLASS	F1R	HE252HJ	250	7200	SATA 3.0 Gbps	16	512
		HE322HJ	320	7200	SATA 3.0 Gbps	16	512
		HE502IJ	500	7200	SATA 3.0 Gbps	16	512
		HE642JJ	640	7200	SATA 3.0 Gbps	16	512
		HE753LJ	750	7200	SATA 3.0 Gbps	32	512
		HE103UJ	1 TB	7200	SATA 3.0 Gbps	32	512
CE HDD	F1CE	HA251HJ	250	7200	SATA 3.0 Gbps	8	512
		HA321HJ	320	7200	SATA 3.0 Gbps	8	512
		HA501IJ	500	7200	SATA 3.0 Gbps	8	512
		HA642JJ	640	7200	SATA 3.0 Gbps	32	512
		HA751LJ	750	7200	SATA 3.0 Gbps	32	512
		HA101UJ	1 TB	7200	SATA 3.0 Gbps	32	512
	F1EG CE	HA252HI	250		SATA 3.0 Gbps	16	512
		HA322HI	320		SATA 3.0 Gbps	16	512
		HA502JI	500		SATA 3.0 Gbps	16	512
		HA642JI	640		SATA 3.0 Gbps	16	512
		HA753LI	750		SATA 3.0 Gbps	32	512
		HA103UI	1 TB		SATA 3.0 Gbps	32	512

Line-up

SAMSUNG HARD DISK DRIVE 2009 PRODUCT LIST

F/Factor	Family	Model	Capacity(GB)	RPM	Interface	Buffer	Sector size
Mobile HDD	M7 (Enhanced)	HM161GI	160	5400	SATA 3.0Gbps	8	512
		HM251HI	250	5400	SATA 3.0Gbps	8	512
		HM321HI	320	5400	SATA 3.0Gbps	8	512
		HM501JI	500	5400	SATA 3.0Gbps	8	512
		HM641JI	640	5400	SATA 3.0Gbps	8	512
	M7U	HM162HX	160	5400	USB 2.0	8	512
		HM252HX	250	5400	USB 2.0	8	512
		HM322IX	320	5400	USB 2.0	8	512
		HM502JX	500	5400	USB 2.0	8	512
	M7	HM250II	250	5400	SATA 3.0 Gbps	8	512
		HM320HI	320	5400	SATA 3.0 Gbps	8	512
		HM400HI	400	5400	SATA 3.0 Gbps	8	512
		HM500JI	500	5400	SATA 3.0 Gbps	8	512
	M5P	HM121HC	120	5400	PATA	8	512
		HM160HC	160	5400	PATA	8	512
	M5S	HM121HI	120	5400	SATA 1.5 Gbps	8	512
		HM160HI	160	5400	SATA 1.5 Gbps	8	512
		HM250JI	250	5400	SATA 1.5 Gbps	8	512
	MC30	HM031HC	30	5400	PATA	8	512

F/Factor	Family	Model	Capacity(GB)	RPM	Interface	Buffer	Sector size
Ultra Mobile HDD	N3U-3	HS122HZ	120	3600	USB 2.0	8	4K
		HS20YJZ	200	3600	USB 2.0	8	4K
		HS25YJZ	250	3600	USB 2.0	8	4K
	N3C	HS06VHF	60	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS08VHF	80	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS12VJF	120	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS16VJF	160	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS06RHF	60	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS08RHF	80	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS12RJF	120	5400	SATA 1.5/ 3.0 Gbps	16	512
		HS16RJF	160	5400	SATA 1.5/ 3.0 Gbps	16	512
	N3A	HS06YHA	60	3600	PATA	8	4K
		HS08YHA	80	3600	PATA	8	4K
		HS12YHA	120	3600	PATA	8	4K

Why Samsung Hard Disk Drive?

Our quality is based on our ACCESS TO FUNDAMENTAL TECHNOLOGY, not only for Samsung's own R&D resources within the HDD division, but also from various R&D resources within the Samsung group. SAIT(Samsung Advanced Institute of Technology) developed Acoustic Noise Suppression Technology, which is utilized in all Samsung HDDs. SAIT also provides Head Stack, Read Channel, Spindle Motor, Servo Control System and Optical Technologies. Similarly, Samsung Electronic's corporate R&D center developed vibration suppression technology.

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